Message

From: DalSoglio, Julie [DalSoglio.Julie@epa.gov]
Sent: 4/22/2015 6:33:40 PM
To: Greene, Nikia [Greene.Nikia@epa.gov]
Subject: RE: Assessment of Current Emissions from Current Mining Activities and Berkeley Pit Complex in Butte--Are There Any? If so, what are they? If so, what are the potential health effects? Is this an issue of public concern?

Flag: Follow up

I note that John has moved from writing in capital letters to use of bolding to make his points.

From: Greene, Nikia
Sent: Wednesday, April 22, 2015 10:00 AM
To: DalSoglio, Julie
Subject: FW: Assessment of Current Emissions from Current Mining Activities and Berkeley Pit Complex in Butte--Are There Any? If so, what are they? If so, what are the potential health effects? Is this an issue of public concern?

He just sent this too.

From: John Ray [mailto:bodinman2003@yahoo.com]
Sent: Wednesday, April 22, 2015 9:26 AM
To: dcoe@mt.gov; daguirre@mt.gov; Dan Walsh; Dave Klemp; drude@mt.gov; Tom Livers; Dan Powers; emerchant@mt.gov; Karen Sullivan; Joe Griffin; Thomas Stoops; Greene, Nikia; jchambers@mt.gov; Daryl Reed; John Ray; Paul Riley; Matt Vincent; Kumar Ganesan; Vranka, Joe; Lisa Peterson; Holly Peterson
Cc: Susan Dunlap
Subject: Assessment of Current Emissions from Current Mining Activities and Berkeley Pit Complex in Butte--Are There Any? If so, what are they? If so, what are the potential health effects? Is this an issue of public concern?

I am interested in the issue of the emissions currently emanating, if any at all, into Butte's ambient air from current MRI mining activities. I am particularly interested in emissions pursuant to dust blowing events. By extrapolation, I am also interested in any emissions from the Berkeley Pit Tailings being emitted, if any, into Butte's ambient air. My interest was aroused by a recent presentation by a Montana Tech Chemistry Professor. This is simply a request for public information. **It involves both current mining operations as well as Superfund**.

The following inquiry contains:
1. Statement of the possible/potential problem or issue based on reported/publicly presented research by Montana Tech Chemistry Professor Katie Hailer.
2. Substantive questions I would like to pose and to which I would like answers.

Montana Tech Chemistry Professor Katie Hailer gave a presentation on exposure assessment and the potential health effects of present mining in Butte at a seminar at Montana Tech on April 16. What I believe to be her abstract of the talk and/or the description of her talk stated (I put in bold letters items of interest.):
Epidemiological studies suggest that cancer rates(1) as well as neurodegenerative diseases (Multiple Sclerosis, Parkinson's)(2) are higher than average in Butte (Silver-Bow County) as compared to the rest of Montana and the nation. Butte is part of the largest Superfund site within the continental US with recognized soil and water environmental ramifications from its 100+ year history as a copper mining town. (These comments would seem to contradict EPA's assertion that cancer rates in Butte are not abnormally high. An interesting issue in itself, given all

that has been spent on the Butte Health Study to prove that cancer rates in Butte are not problematic compared to Montana and the USA.)

She stated in an IMBRE abstract for her talk :
Our previous studies recruited volunteers based upon mapping and demographic data to determine if potential chronic exposure to these metal mixtures could lead to changes in miRNA expression patterns. Human hair and nasal cell samples were collected from adults from age 22 to age 84 living within close proximity to active surface mining as well as near historic mine tailings (n=17). Control samples, ages 20 to 62, were collected from individuals living in Bozeman, MT (n=8,) a town without historical or current mining practices. Elemental analysis was performed on the hair samples by inductively coupled plasma mass spectrometry (ICP-MS) and several elements (copper, manganese, and molybdenum) were found to be elevated in the Butte population, with low levels of selenium and zinc. Chronically high levels of redox active metals are known to participate in inflammatory response and oxidative stress (3). In addition, aberrant levels of metals, such as high copper and low zinc, are implicated in a variety of diseases, especially neurodegenerative diseases (4). Our previous work also looked at microRNA expression patterns between the two groups. Despite the small group size, over 200 statistical changes within miRNA expression between the Butte and Bozeman groups were observed. Preliminary miRNA data show a number of up-regulated micro RNAs that are putative oncomirs (mir-221 and mir-222). One of the most interesting miRNA differences between groups is the up-regulation of microRNAs 146b-5p and 146a-5p that are strongly correlated in an inflammatory response via the NF-κB pathway (5). In addition to microRNAs 146a and 146b, there are a number of other miRNAs also responsible for regulation of inflammatory pathways. ***These data lead us to believe that current open-pit mining practices within the city limits of Butte, MT may be causing chronic inhalation of various metals. These elevated metals could cause aberrant biological regulation of important enzymatic and biological cofactors which, in turn, may impact human health.***
We hypothesis that the individuals living in Butte, MT are being exposed to chronically elevated concentrations of metals via inhalation and these metals are in turn causing a chronic inflammatory response within individuals living in close proximity to the open-pit copper mine*.*
The following specific aims are proposed in order to investigate the hypothesis.
Specific Aim 1: Analyze hair and blood samples by ICP-MS to determine metal concentrations within the Butte, MT population and compare to results from a control population from Bozeman, MT. Hair samples from larger and age- and gender-matched populations will be collected to assess metal exposure and nutritional status. Secondary blood samples will be used to confirm elevated or depressed levels of any given element. The two sampling techniques will give a very comprehensive picture of metal accumulations between the two populations. We propose to recruit 100 adults from Butte and 100 adults from Bozeman to participate in this study. Lifestyle and demographic information will be collected at the time of hair and blood collection. Statistical analysis will be used to determine differences between populations (Butte vs. Bozeman) and also within gender (male vs. female).

Specific Aim 2: Extract total RNA from blood samples and use to determine cytokine and other inflammatory markers via PCR Array. Expression of 30 key genes, cytokines and receptors, mediating the inflammatory response will be analyzed from each individual. Total RNA will be extracted from blood serum and used to create cDNA. This cDNA will be applied to a commercially available PCR Array plate, real-time PCR will be run, and data will be analyzed for inflammatory gene expression pathways.

As I understand her research, she is investigating the potential exposure pathways and potential health effects of human exposure to releases, if any at all, from MRI's current operations in Butte. By extrapolation, the Pit may well be part of her study as I understand it.

WHY AM I WRITING TO YOU?:

I realize that her research is preliminary and no firm conclusions have as yet been reached. However, this issue should not wait for the conclusion of her research. I assume that the State and EPA are monitoring emissions from MRI's operations. So I have the following questions:

1. Are substances such as copper, molybdenum, etc. being emitted into the ambient air from current MRI mining activities? I am particularly interested in dust blowing events.

2. What testing has been done in order to determine the content of the discharges into the ambient air from current MRI mining activities?

3. What is the being discharged from current MRI operations into Butte's ambient air? I am particularly interested in dust blowing events.

4. Do the substances being emitted from current MRI mining activities, if any, into the ambient air pose any health risks to Butte citizens?

5. If so, what is being done to mitigate these potential health effects?

6. What is being emitted into the ambient air from the Berkeley Pit's Tailings? I am particularly interested in emissions during dust blowing events?

7. Are emissions, if any, under # 6 above being monitored?

8. Do these emissions, if any, into the ambient air pose any health risks to Butte citizens?

9. If so, what is being done to mitigate these health effects?

Thanks you for a response.

Dr. John W. Ray